Swift Science Workshop

Neil Gehrels

NASA-GSFC

HEAD Meeting

September 7, 2004

Swift Observatory
is complete!!

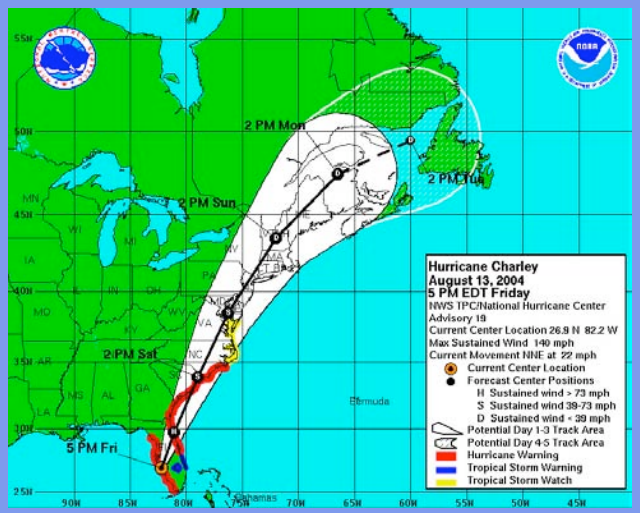
Launch from KSC
in Oct. 2004

Arrival at KSC

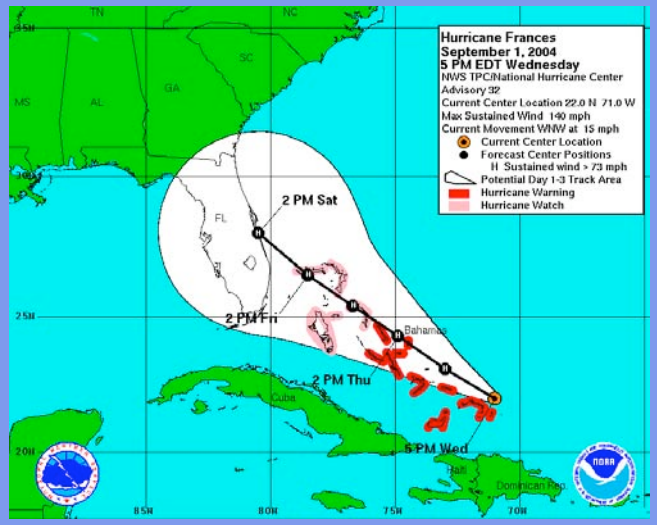
Flight-ready observatory with solar panels installed in cleanroom at KSC

Florida Becomes Hurricane Alley

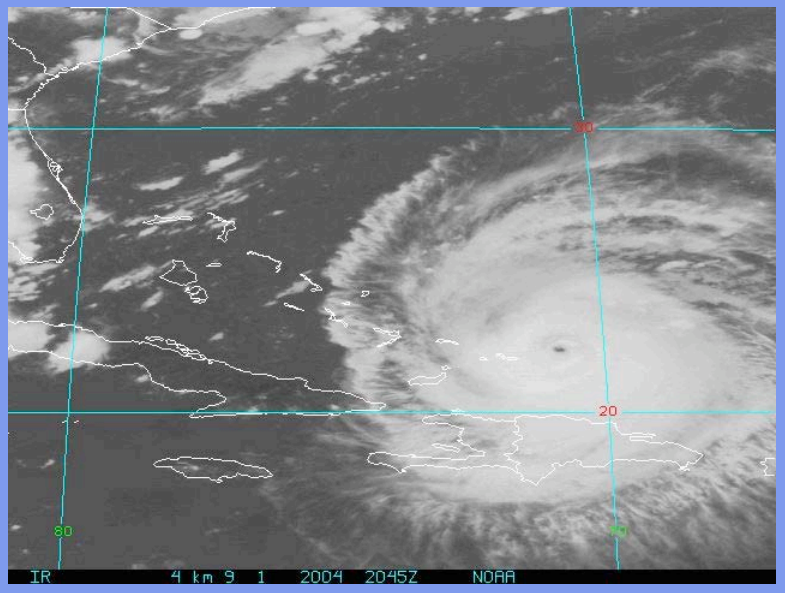
Hurricane Charley Aug. 13



Hurricane Frances Sept. 4



Hurricane Ivan Sept. 11 ?



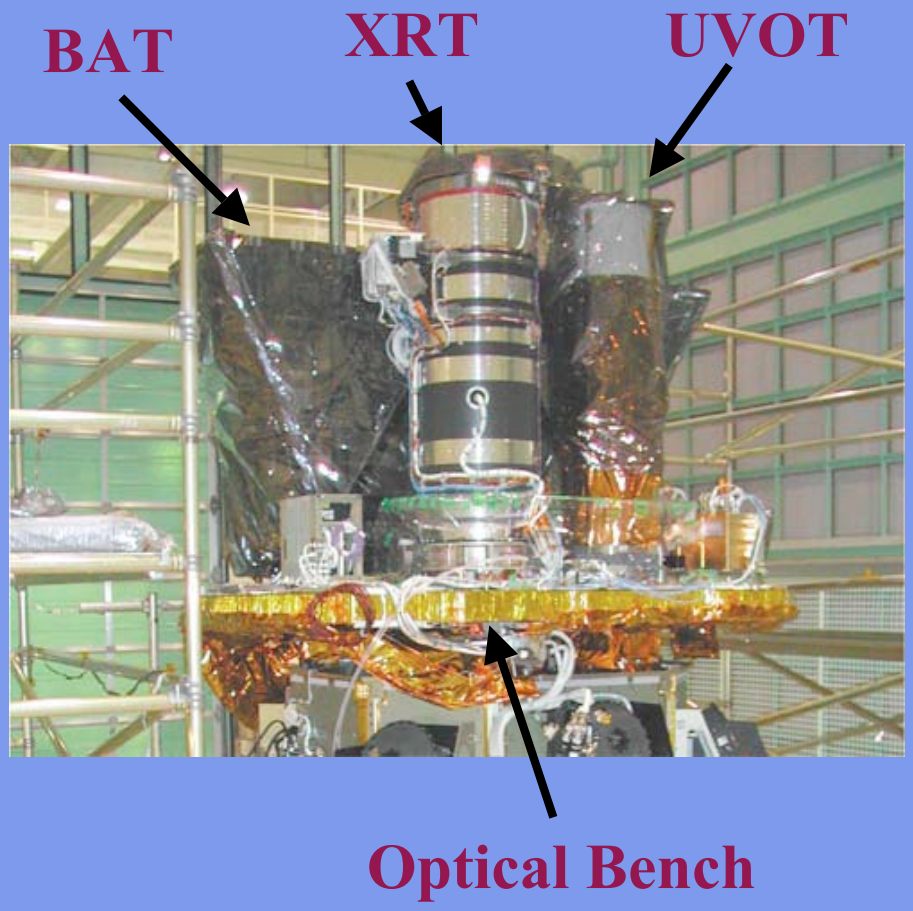
Launch Status Report as of Sept 7

- **Swift observatory and GSE support equipment survived Frances with no damage**
- **Swift prep building A has a torn roof on one side, but the Swift part of the building including offices and clean rooms are safe**
- **KSC sustained damage to Vehicle Assembly Building (Shuttle program) and Cocoa Beach has significant flooding, breached sewer system and no power**
- **If Hurricane Ivan misses KSC, launch date is approximately October 16**
- **If Hurricane Ivan hits KSC, launch date is no earlier than October 22**

Swift Instruments

Instruments

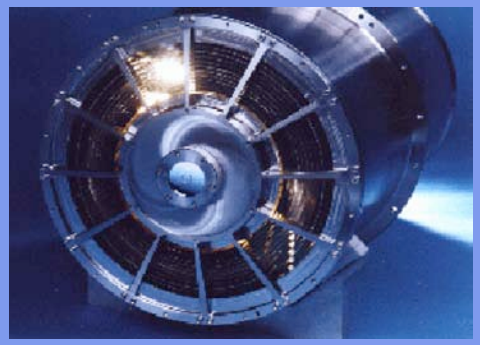
- **Burst Alert Telescope (BAT)**
  - New CdZnTe detectors
  - Most sensitive gamma-ray imager ever
- **X-Ray Telescope (XRT)**
  - Arcsecond GRB positions
  - CCD spectroscopy
- **UV/Optical Telescope (UVOT)**
  - Sub-arcsec imaging
  - Grism spectroscopy
  - 24th mag sensitivity (1000 sec)
  - Finding chart for other observers

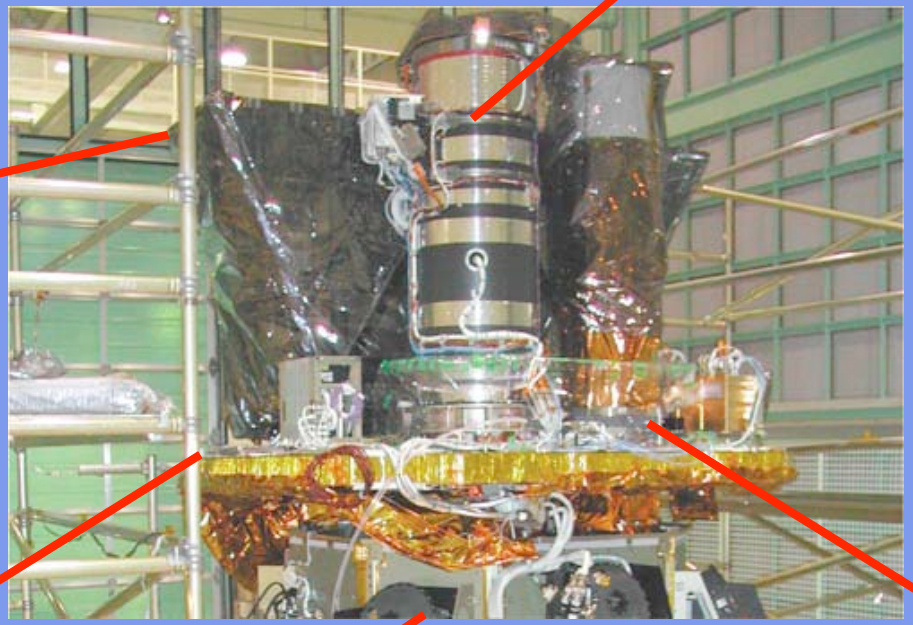


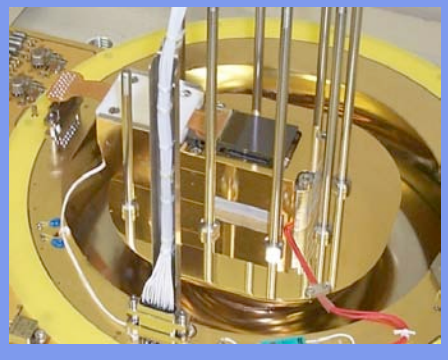
Spacecraft

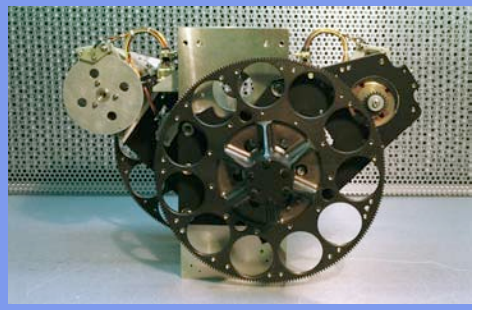
- Autonomous re-pointing, 20 - 75 s
- Onboard and ground triggers

Swift Instruments









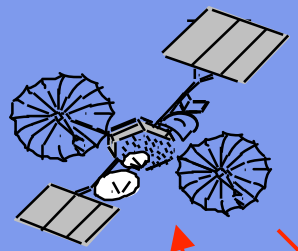
Swift Mission

Spacecraft

Spectrum Astro
Rapid Autonomous Slews

Payload

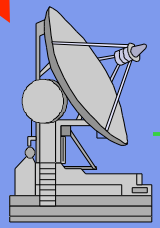
BAT
XRT
UVOT



TDRSS

GCN

Malindi



Mission Operations Center (MOC)

PSU

Science Center

GSFC

GCN & Web

HEASARC
UK
Italian
Archives

User Community

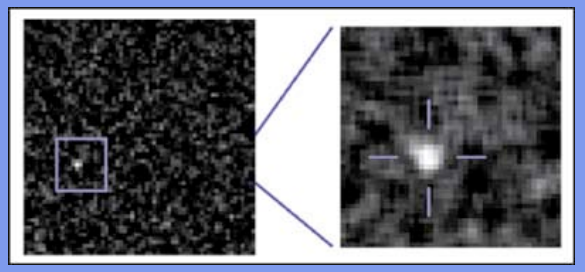
Launcher

Delta 2320
600 km X 22^{o} inclination

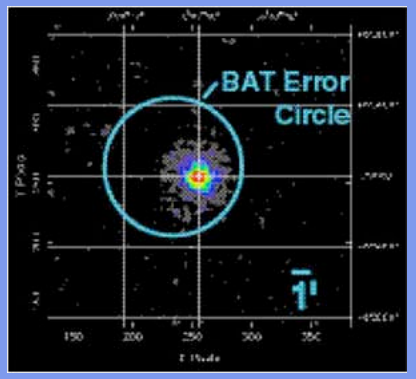
Mission Features

- **Multiwavelength observations on all time scales**
- **>100 GRBs per year of all types**
- **BAT sensitivity 2 - 5 time better than BATSE**
- **Arcsec positions & counterparts for 100's GRBs**
- **Rapid GRB notifications via GCN**
- **Identification of host galaxies offsets**
- **X-ray and UV/optical spectroscopy**
- **Orbital lifetime > 8 years**
- **Upload capability to slew to GRB and transients detected by other observatories**
- **All data public as soon as processed**

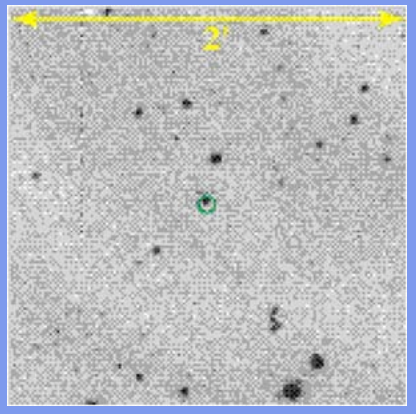
BAT



XRT



UVOT



Partner Follow-up Telescopes

- **AEOS Telescope (Hawaii)**
- **ARAGO Telescope (Antarctica)**
- **ARC Telescope (New Mexico)**
- **Brera Observatory (Italy)**
- **Chandra**
- **ESO (La Silla, Paranal, VLT)**
- **ESA's INTEGRAL mission**
- **Fast Alert MachinE (Italy)**
- **Faulkes Telescopes (Hawaii & Australia)**
- **Galileo National Telescope (La Palma)**
- **Hubble Space Telescope**
- **Hobby-Eberly Telescope (Texas)**
- **INTEGRAL**
- **Isaac Newton Telescopes (La Palma)**
- **KAIT (California)**
- **W. M. Keck Observatory (Hawaii)**
- **Large Binocular Telescope (Arizona)**
- **LIGO (Louisiana and Washington)**
- **Liverpool Telescope (La Palma)**
- **McDonald Observatory (Texas)**
- **Milagro Gamma-ray Obs. (New Mexico)**
- **NASA (IRTF, Hubble & Spitzer)**
- **NOAO (CTIO, KPNO)**
- **Nordic Optic Telescope (La Palma)**
- **Okayama Observatory (Japan)**
- **Rapid Eye Mount Telescope (Chile)**
- **ROTSE-II (New Mexico)**
- **SARA Observatory (Arizona)**
- **SIRTF**
- **South African Large Telescope**
- **Super-LOTIS (Arizona)**
- **TAOS Telescope (Taiwan)**
- **TAROT Telescope (France)**
- **Tenerife Observatory**
- **U.S. Naval Observatory (Arizona)**
- **VERITAS Observatory (Arizona)**
- **WASP Telescope (La Palma)**
- **WIYN Observatory (Arizona)**
- **Wyoming Infrared Observatory**
- **XMM Newton**

PROGRAM

08:00	Registration	
08:30	Introduction	Gehrels
08:45	Swift operations overview	Nousek
09:05	BAT instrument operations	Barthelmy
09:20	XRT instrument operations	Burrows
09:35	UVOT instrument operations	Mason
09:50	Ground system overview	Marshall
10:00	Data access from HEASARC/SDC	Angelini
10:30	Break	
10:45	BAT data analysis software	Markwardt
11:15	XRT data analysis software	Tagliaferri
11:45	UVOT data analysis software	Still
12:15	Data centers in the UK and Italy	Osborne
12:30	Swift Science Center	Holland
12:45	Lunch	
01:45	Swift in the context of GRB understanding	Meszaros
02:15	Ability of Swift to detect & locate GRBs	Fenimore
02:35	Follow-up team interfaces to MOC	Hurley
02:50	INTEGRAL results & interaction with Swift	Mereghetti
03:15	HETE-2 results & interaction with Swift	Lamb
03:30	GRACE collaboration and JANET	Kouveliotou
03:45	Break	
04:00	ROTSE-III	Don Smith
04:15	Super-LOTIS	Milne
04:30	Swift and the GTN	Cominsky
04:45	Swift Follow-up at ESO & REM	Chincarini
04:57	The Robotic Palomar 60" Telescope	Fox
05:09	Robonet	Bode
05:21	Rice U. CCD Imager for AEOS	Ian Smith
05:33	The Burst Populations Swift Will Detect	Band
05:45	An Improved Standard Candle for GRBs	Liang